

lucid, and to the point. Those desiring detailed information on fleas will find for the first time in a single volume a complete up-to-date survey of the subject.

This book will appeal to a very wide audience. I recommend it highly for use in entomology departments and in medical schools.

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An Atlas of the Fleas of the Eastern United States. Allen H. Benton. Marginal Media, Fredonia, N.Y. 1980. 177 pp. 63 maps. Looseleaf, Soft Cover. \$6.50.

The book was designed to facilitate the study of the geographic distribution of the fleas of the eastern United States by permitting the qualified reader to spot the known records and to readily add and map new data as they appear.

There are a few introductory pages on the 'natural history and ecology' of fleas and an outline of the history of Siphonapteran studies for the area. A checklist of the fleas of the eastern U.S. is presented ahead of the atlas of 63 pages of maps, on which dots are used to indicate the known records, arranged by county. A set of larger maps near the front of the book shows the counties for the states encompassed. A glance at the maps suffices to grasp the known information on any of the species regarding its distribution within the region in question. For each species listed, the author also provides a summary of available information on hosts, seasonal abundance, and medical importance. One or two references are cited in each case as sources for additional data. Pertinent state and regional references and some general ones, are cited at the end of the book, preceding an appendix on the distribution of the fleas of Minnesota. This book does not purport to be a guide for the identification of fleas, nor is it a taxonomic work in any sense of the term. Not even the original descriptions are cited.

The author worked diligently and accurately in checking references and in tracking down and verifying certain critical specimens. None of the species known to occur in the territory seem to have been omitted, and the scientific names used agree with the standard literature. The comments on bionomics and seasonal variations for the various species will be appreciated by all who have had to comb scattered references seeking such meaningful information. The appendix has valuable ecological notes on Minnesota.

The manner in which the book is organized presents problems for the reader. The list of species included in the atlas (pp. 24–26) is arranged by family and subfamily, but there is no indication of the pages where the

particular maps and discussion are to be found. The species are not arranged alphabetically (even by family) in the list or in the sequence of maps, and it is difficult to find the appropriate page one seeks, even if he is familiar with the scheme of classification and the system used. The sequence employed is based upon that employed by Hopkins and Rothschild in the Catalogues or by R. E. Lewis in his host-lists, but the Catalogue series had indices and Lewis' papers were arranged alphabetically and hence are easy to use. Benton apparently relies upon the maps to indicate what he means by "eastern United States," but the territory included does not have ecological or natural boundaries. Minnesota is treated, but not Iowa, Mississippi, Arkansas and Louisiana, all of which have a western boundary that is east of that of Minnesota. If Minnesota were not discussed, it could be stated that the book was restricted to the states east of the Mississippi River. The appendix on Minnesota is somewhat confusing regarding its bibliographic citation, since the authors are not designated. By checking the bibliography it can be deduced that the 'senior author' mentioned here and there in the text is Benton, and the 'junior author,' R. Timm.

There are inherent disadvantages in any atlas on fleas because of the inadequacy of available data. Even in the U.S. there are vast areas where little or no collecting has been done. In consequence, many species-maps may unavoidably mislead the non-specialist into believing that the blanks represent the absence of species instead of the absence of data. Many of the fleas listed seem to be found only near certain university-towns harboring entomologists or mammalogists. The following example illustrates the problem. Bird-fleas would be expected to have a broad range, considering the extent of the territory covered by their hosts (both as species and as individuals) but *Ceratophyllus celsus* is listed only from four states and in three widely-separated areas.

The author must have been thinking of the U.S. and Canada when he wrote "Flea students are extremely fortunate in having the entire literature in their field quite well presented in a few excellent sources." The statement does not apply to Asia, South America, etc. The notes on medical significance refer to the species in general and not merely to the eastern part of this country. For example, unless the reader realizes that plague does not occur in the east, he can be misled. It is regretted that no conclusions, generalizations or interpretations of the data are presented, and that there is no discussion of zoogeography, for example. It also would have been edifying to compare the range of the host with that of its fleas. Thus, pocket gophers occur in Georgia and Florida, but their characteristic fleas are unreported south or east of Illinois and western Indiana. Unfortunately, the format employed precluded the presentation of data to substantiate the remarks. *Nosopsyllus fasciatus* is stated to be "most abundant in the summer." but is this true throughout the eastern U.S. or only in the north? The species has been considered a flea of temperate zones and the impression

exists that in many areas *N. fasciatus* is most common in cool weather.

This book will be extremely useful to those who are interested in reviewing, compiling, or adding to data on the Siphonapteran fauna of the eastern United States, or who want access to more information on those species. It should also serve to encourage research along those lines, which would be a boon, for a real need exists for such endeavors.

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Leafhopper Vectors and Plant Disease Agents. K. Maramorosch and K. F. Harris, eds. Academic Press, 111 Fifth Avenue, New York, NY 10003. 1979. 654 pp. Price \$42.00.

This text, a companion volume to the excellent treatise on *Aphids as Virus Vectors*, is part of a planned series on vectors and vector-borne diseases. It is organized into the following five parts: Part I includes two chapters on the taxonomy and bionomics of leafhoppers; Part II, three chapters on the worldwide importance of leafhoppers and planthoppers as vectors; Part III, four chapters on vector-disease agent-plant interactions; Part IV, five chapters on experimental approaches to virus-vector and MLO-vector research; and Part V concludes the volume with five chapters on the leafhopper transmission of specific viruses and prokaryotes. These last chapters give detailed information on rice viruses and MLOs and control of their vectors, corn stunt, western X-disease, and xylem-borne plant pathogens.

Excellent reviews of leafhopper vector research have been contributed by 25 authorities from eight countries. Many of the chapters are much more than organized reviews or summaries of current research. The authors have made a special effort to draw conclusions based on their own experiences and have raised questions that hopefully will stimulate others to make further contributions to leafhopper vector research. The text includes a number of useful illustrations of good quality and many valuable summary tables.

Although information in portions of this text have appeared in past review-type texts and series, this particular collection of papers will be an excellent addition to the library of anyone concerned with vectors and vector-transmitted plant diseases. The editors are to be congratulated on putting together a coherent volume with minimum duplication in spite of the numerous contributors. The extensive lists of key references make this text of great value to teachers of advanced entomology and plant pathology courses.

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